Special Article

SMALLPOX INCREASING IN CALIFORNIA.

By ALLEN F. GILLIHAN, M. D., State District Health Officer, Sacramento.

Smallpox is on the increase in California. More cases of this disease were reported to the State Board of Health in 1918 than had been reported during any two adjacent years of the preceding fifteen.

The cumulative graph accompanying this article shows that during the five-year period, 1913 to 1917, inclusive, the average total number of cases per year was about 480, while during 1918 over eleven hundred were reported. So far 1919 shows an ever higher rate; January 109 cases, February 160 cases, together, give a total greater than for the whole year of 1916.

Not only is this increase true for California alone; the disease is increasing throughout the world in general. A recent very important report of Dr. Bruce Low to the Local Government Board of London draws the attention of this governing body to the increased prevalence of smallpox generally over the world, and refers to its increasing virulence. Reports from the Philippine Islands show a marked increase there; 1,475 cases of smallpox with 728 deaths occurred in Manila during the second quarter of 1918. An epidemic in Eagle Pass, Texas, last winter, of over 150 cases, had a death rate of 22 per cent. (33 deaths).

Smallpox has been dormant throughout the world for a number of years, the total annual number of cases has been small, the type of disease very mild, the death rate remarkably low, and its frightfulness and loathsomeness in epidemic form unknown to a greater part of the present generation.

The severity of the reaction following old methods of vaccination, with sore arm, long continued discharging wound, and ugly scar, are painfully remembered by many as something more to be feared than the mild type of smallpox which occasionally appeared, and therefore vaccination has been gradually falling into disuse.

In several recent smallpox investigations in this state effort was made by inspectors for the State Board of Health to ascertain the number of successfully vaccinated children among those attending schools in certain districts where smallpox had appeared. It was found that, as an average, not over 30 per cent. of those in school had ever been successfully vaccinated. Many schoolrooms, with classes ranging from forty to sixty pupils, were visited, in which only three or four of the children had ever been successfully vaccinated. This situation was usually found in the lower grades; in the higher grades and high schools the proportion of successfully vaccinated frequently went as high as 50 to 60 per cent. In one school of about twelve hundred children in a certain city where smallpox had suddenly developed it was found that only 6 per cent. had ever been vaccinated.

All Ages Susceptible to Smallpox.

Before vaccination was introduced in 1798 smallpox was a disease of childhood, all persons reaching adult life having had the disease during the first few years of life. In certain diseases such as scarlet fever, age develops immunity, and if one passes through childhood without having had the disease it is most improbable that he will take it later in life. With smallpox this is not true: there is no immunity against the disease except that acquired through a previous attack or through successful vaccination. The protection conveyed by one attack does not hold absolutely true in every instance, for once in about twenty thousand cases one hears of a person having a second attack. However, this proportion is so small, it can be safely stated that one attack protects. So much can not be said for vaccination. The protection conveyed by vaccination, although as complete as that conveyed by an attack of smallpox, is much shorter lived than the protection following an attack of the disease; at best a primary successful vaccination in the great majority of cases gives protection against smallpox for several years, but rarely for life.

Vaccination Protects for a few Years Only.

The majority of the adults of the present generation were successfully vaccinated in childhood. This protection is gradually running down. Repeated instances are noticed of smallpox occuring in adults who had been successfully vaccinated many years before. This does not mean that the vaccination was of no value; but it does mean that protection from vaccination is comparatively short lived—several years at most in the majority of cases.

Of the cases occurring in California during 1918, careful histories are available for over seven hundred.

Vaccination Histories in 770 Smallpox Cases in 1918.

Vaccinated successfully 2 years ago	1
Vaccinated successfully 5 years ago	2
Vaccinated successfully 6 years ago	1
Vaccinated successfully over 7 years ago	48
Successfully vaccinated	52
Never successfully vaccinated	718
Total where histories were obtained	770

Age Incidence in 770 Smallpox Cases in 1918.

Vaccinated successfully—		Never vaccinated—	
10 years old	1	0 to 10 years	178
14 years old	1	11 to 20 years	144
21 to 30 years	12	21 to 30 years	89
31 to 40 years	16	31 to 40 years	98
41 to 50 years	9	41 to 50 years	45
51 to 60 years	9	51 to 60 years	15
Age given as child or adult	4	Over 60 years	4
		Age given as child or adult	145
Vaccinated	52	Not vaccinated	718

These tables show that among the *vaccinated* practically *all the cases were over twenty years* of age, while among the *unvaccinated over three-fourths were under twenty years* of age.

Of the vaccinated who had the disease it will be seen that over nine-tenths were vaccinated over seven years before—in fact, in several cases the vaccination was forty years before. In other words, vaccination in childhood had protected these fifty-two cases for a number of years but their protection had gradually run out. In many people vaccination carries protection for long periods or even for life; if this were not so the proportion of vaccinated to

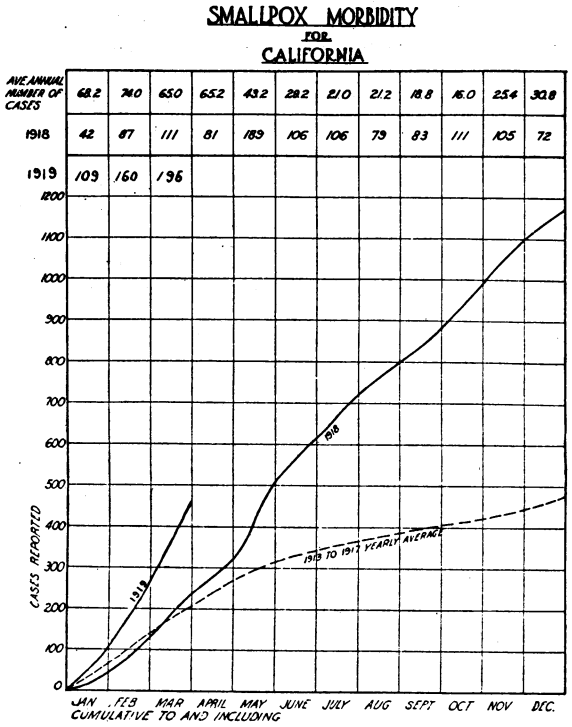
unvaccinated would have been quite different from that of 52 to 718.

Factors Favoring Spread of Smallpox.

A century ago smallpox was a disease that was always present; it caused from one-fifth to one-tenth of all deaths each year, but it carried with it individual immunity in those who recovered. Practically the entire adult population consisted of those who had lived through the disease in early life and were protected against further attack.

Vaccination changed this. Smallpox, as an ever present disease with its high death rate, was gotten rid of. The immunity which was good for life, through having had the disease, was replaced by an immunity through vaccination good for only a few years.

Unfortunately little effort has been made to renew this immunity through revaccination later in life, and during recent years less and less attention has been paid to vaccination of children in early life, until at the present time there are probably more people in the world who are susceptible to smallpox than there have been at any time during the past few centuries.



Errors in Diagnosis.

An important factor in the spread of smallpox is that many physicians now in practice have had no personal experience with the disease. They have had to depend upon textbook descriptions from the older writers, and mistakes in diagnosis were bound to occur. In following a textbook description of an epidemic disease the reader unconsciously, and naturally, attempts to keep the theoretically typical case in mind, forgetting for the moment that before an epidemic gains headway atypical cases are more frequent than typical; and it is only as the epidemic progresses that cases become more and more typical. It is usually through such atypical cases, lost in mistaken diagnosis, early in an outbreak, that epidemics gain headway.

Several times while investigating smallpox, the writer has heard the attending physician state: "This can not possibly be smallpox because there has been no secondary fever." On informing the physician that such a case as the one under consideration, giving a history of two or three days' severe illness, followed by a pustular eruption, which on examination was found to be more profuse on the face and extremities than elsewhere on the body could be nothing else than smallpox, the invariable reply has been: "Then the textbooks are all wrong because they state that in smallpox a secondary fever follows the appearance of the eruption." It has been necessary to explain that the secondary rise in temperature was suppurative, depending on the extent of the eruption, and did not always appear.

Another error in diagnosis occuring with less frequency and with less harm from a public health viewpoint is where the diagnosis of smallpox is made solely upon one point, for example on the pustular appearance of the eruption. Upon more than one occasion it has been impossible to convince the attending physician that such a case was not necessarily smallpox. A prodromal illness of two or three days, the progressive character of the eruption which followed, with preference for face and extremeties, when compared with an eruption which usually appears suddenly, without prodromal illness, with preference for the trunk rather than the extremities, and made up of successive crops of easily ruptured vesicles, should be sufficient in the vast majority of cases to identify the one as smallpox and the other as chickenpox. Enquiry into the progress of the history of a case is of the utmost importance in identifying smallpox. It is indeed surprising how often this is neglected in arriving at a diagnosis. Also an inquiry into history of previous illnesses is very important. Chickenpox practically never occurs twice in the same individual and the definite history of a previous attack is of great assistance in ruling out this disease.

The State Board of Health recognizes that diagnosis in the irregular and atypical forms of smallpox at times is very difficult. It employs experts trained in the recognition and control of this as well as other epidemic diseases. It is willing to send one of these experts at any time to assist local health authorities in arriving at correct diagnoses and in instituting methods for the control of these diseases.

The Negligent Health Officer.

The neglect of the local health officer to fully investigate all suspected cases, in many instances, has been the means whereby smallpox has gained foothold in the territory under his supervision. An instance of this occurred last summer when a health officer, on seeing a case which had been reported to him as smallpox, declared it to be chickenpox and did nothing further about the matter. Several months later one of our district health officers, while investigating an outbreak of smallpox in a near-by city, visited this community and found that there had been between 150 and 200 cases of smallpox there during the summer. Three children were

removed from school in the crusting stage and ten houses were placed in quarantine the first day in the community. Not only was the smallpox in the near-by city traceable to this community but before the investigation was completed and the epidemic checked it was discovered that outbreaks of the disease in seven other localities were also traceable to this same original community. Happily the active work on the part of the health officers of these other localities effectively checked the further spread of the disease.

Missed and Concealed Cases.

The missed case—one that has not been ill enough to require the services of a physician—is another factor in the spread of smallpox.

Although these mild cases usually transmit the disease true to type, several times the writer has seen cases of marked severity contracted from other cases in the same house which were so mild that the patients did not even take to bed. The case that is concealed for fear of quarantine is a matter of entirely different moment: these people are invariably most careless in the transmission of the disease and should be shown no sympathy. During the prevalence of mild smallpox these concealed cases are frequent, and it requires a great deal of work on the part of the health officer to search them out.

Vaccination—the Only Protection Against Smallpox.

It is not intended in this article to enter into any lengthy discussion about the protective value of vaccination. The reviewing of the returns from those countries which have adopted compulsory vaccination, comparing the annual death rate from smallpox for the century or half century before vaccination was adopted with the annual death rate from smallpox for the same period of time following the adoption of vaccination, should convince any one capable of being convinced that the sudden great change in the death rate from this disease was due entirely to vaccination.

When the statistics of the recent world war are compiled they should be most convincing in regard to smallpox, because this is the first time that armies on both sides were thoroughly vaccinated against the disease; amongst the many million of men involved, deaths from smallpox have been practically unknown. Compare this with the last war over the same ground—the Franco-Prussian War of 1870-71—where the Prussian army, with over one million in the field, all thoroughly vaccinated, lost only 297 from smallpox; while the French army, of which only about one-third was successfully vaccinated, had over 23,000 deaths from this disease.

Modern Method of Vaccination.

That any one familiar with modern surgical technique should adopt for a particular operation a method, not only obsolete, but actually harmful, is, to say the least, inexcusable. The public is acquainted with recent advances in modern aseptic surgery and is justified in the stand which it has taken in opposing vaccination, on account of the very unsatisfactory way that it is frequently done.

The State Board of Health realized the need of instruction in this matter when they caused to be included in the "Regulations for the Prevention of Smallpox" full instructions for the technique of vaccination. This recommended method was thoroughly tested for several years before being adopted by the board. Many thousand vaccinations by this method have proved it to be the most satisfactory. The scarification is painless, it is done instantaneously, if instructions are followed the vaccination does not produce harmful results, discharging wounds and sloughs are unknown, and resulting scars are small. The writer recently saw a number of vaccinations made by him by this method in 1913; the scars were small and inconspicuous, approximately the size of the head of a lead pencil, but met with all the requirements of successful vaccination.

Certain things are of utmost importance in performing vaccination. The area of scarification should be as small as possible, not over one-twelfth of an inch in diameter. Scraping the skin with a scalpel over a considerable area or cross-scratching with a needle should be prohibited by law. Keeping the wound exposed "to dry" is a most dangerous practice; the patient may fan dust on to the moist surface, or worse, may unconsciously blow a fine spray of saliva over the wound. The use of a celluloid or metal vaccine shield or a bunion plaster or rolls of gauze to cover the wound are most harmful. They tend to retain moisture and to produce local congestion. The best way is, immediately following the insertion of the vaccine, to cover the wound with a square of sterile gauze, two to three layers thick, held down at the edges by strips of Z. O. plaster. The square should be of such size that the plaster does not cover any one of the scarified areas. Bandage or plaster should not be carried around the limb, as this would retard circulation. The patient should be carefully instructed "Don't get the dressings wet," "Don't scratch the wound," "Don't pull the dressings off" and to return in so many days, depending upon whether the operator was looking for an immunity reaction or was expecting a primary or secondary "take."

Recapitulation.

The effort of this article has been to show that smallpox is increasing throughout the world, not only in number of cases, but also in death rates, and that California shares in this increase.

The mild form of smallpox and the severe reactions following poor methods of vaccination are largely responsible for the neglect of vaccination which has become almost universal.

Vaccination is the only protection against smallpox, but this protection lasts for only a few years, and must be repeated at intervals if an individual desires to avoid the smallpox.

Methods of vaccination are recommended which do not produce harmful results. And the statement is now made in closing that in the opinion of the writer vaccination should be done by spe-

cial officers delegated to that duty, that it should be done by prescribed methods, and that it should be free to all people.

Original Articles

SOME OBSERVATIONS NOTED IN THE WORK OF THE MEDICAL ADVISORY BOARD OF THE HEALTH COMMISSION.

By GEO. L. COLE, M. D., Chairman, Los Angeles.

When it became known that there was to be an epidemic of influenza in Los Angeles a number of medical men of the city, including Drs. H. G. Brainerd, W. A. Edwards, S. S. Salisbury, W. L. Wills, S. D. Brooks, J. Rollin French, Hubert True, E. A. Ingham and myself, were asked to meet the Health Commissioner, Dr. L. M. Powers, in the office of the Mayor, and later were appointed as an advisory board.

The epidemic was existing in New York, Philadelphia, Boston and other eastern cities to such a degree that it made us all feel aware of the fact that we were to have here an epidemic of no small dimensions to cope with, and the question uppermost in the minds of Mayor Woodman and Dr. Powers was, "What could be done to lessen the number of deaths that were necessarily bound to occur in the City of Los Angeles?"

Previous to this time Dr. Powers had communicated with Dr. Royal S. Copeland, Health Commissioner of the City of New York, and with Dr. Wm. C. Woodward, Health Commissioner of the City of Boston, and others, asking for suggestions as to the best way of handling the epidemic in Los Angeles and asking that they recount to him somewhat of the work that had been done in eastern cities.

Various methods had been pursued, and in New York City quite a different method of procedure had been established from that in Philadelphia, Washington and Boston.

One fact stood out in grewsome prominence in these reports, namely, that Los Angeles must give attention and foresight to the fact that a large force of employees would be necessary to dig graves for those who died of the disease.

We have since learned to be true that in many instances relatives have been called upon to dig graves for their loved ones, and even by doing this the accumulation of dead bodies in storehouses had been necessary as an adjunct to the undertaking establishments of eastern cities.

I think the foregoing fact is sufficient to inform you all that we, as a body working in conjunction with your health department, fully realized the grim task laid before us.

The question asked by the Mayor was "How can the number of deaths be limited to the smallest number?"

It was at this time pointed out by some members of the Advisory Committee that while it might not result in greatly lessening the number of cases, to close theaters, schools and churches, yet such a procedure would result in slowing down the onset of the epidemic to the point where, on account of the large number of physicians and nurses having gone into the service, the remaining ones could care for the sick to a better degree, and the hospitals would not be overcrowded; that a municipal hospital might be established for the care of those unable to pay for hospital service, and that in addition to this was the hope that by so doing the mortality of the epidemic might be to some degree lessened.

At the outset let me say to you that the task of the Health Commissioner and the Advisory Board has not been from all respects an easy one: *no drastic* measures can be introduced into a city as full of happiness and activities as Los Angeles was at the beginning of October without curtailing such happiness and enjoyment and without treading upon the toes of many that would be affected by losses of revenue from their institutions.

On the whole, however, I wish to say that when the matter was placed frankly before the theaters, churches and the school board they as fully acquiesced in their willingness to help as could have been expected.

Many seemed to think that the closure would be for a week; some for two weeks; many felt that it was a matter that would be speedily brought to an issue. Many of the theater men and moving picture men later on complained because after three weeks of closure there were more cases reported and more deaths existing from day to day than when the closing ordinance was promulgated. Their reasoning, therefore, was that the closing had done no good.

To you, as medical men, it does not seem that such a view could have been taken. Nevertheless such was the case, and they thought that as no good had come of the closing, everything should be opened at once.

There was a unanimous opinion of the Board that the theaters and churches should be closed, and *remain* closed until the crest of the epidemic was well passed.

With regard to the schools there was at first not a unit of opinion; some had the idea that schools, being under the inspection of medical attendants and under the care of teachers with more than ordinary intelligence of the masses, could be so managed as to eliminate the carriers of the disease, and that it would be better for the children to be in the large airy school rooms than in their own homes. However, when it was known to be a fact that the medical service in the schools of Los Angeles was not sufficient to inspect the schools oftener than every fourth or fifth day if they should work diligently, it was concluded to close them as the churches and theaters were to be closed.

Another item to be considered in this feature was the fact that the theater people would certainly have more just reason to complain if private institutions, like the theaters and moving picture houses, were to be closed, and public institutions like schools were to remain open.

It seemed to the committee after due consideration that it was *wisest* to include the schools with the ban of the theaters and churches.

As time went on—week after week—there came a persistent and insistent demand of the theaters and moving picture places that we were keeping